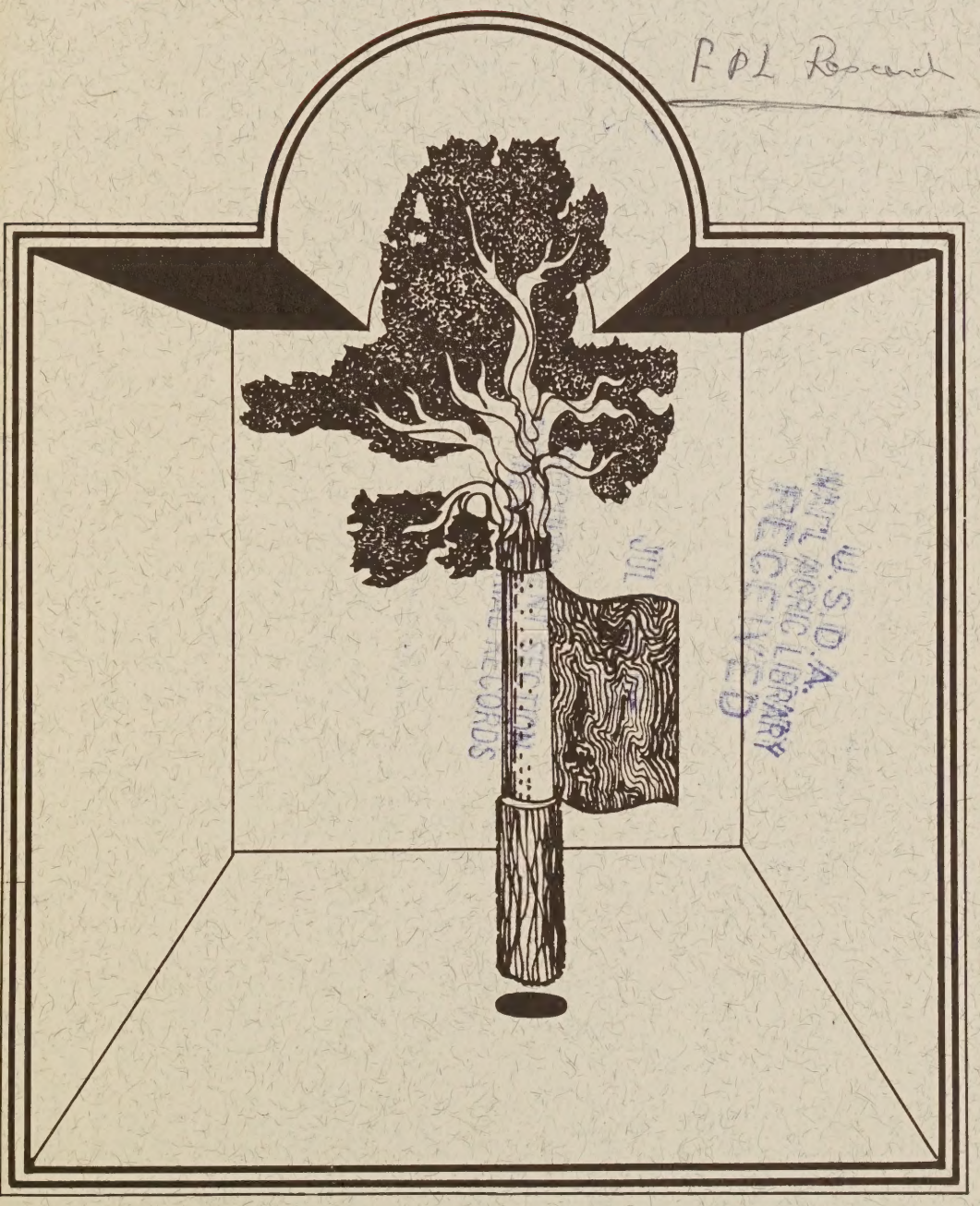
DIVIDENDS FROM WOOD RESEARCH



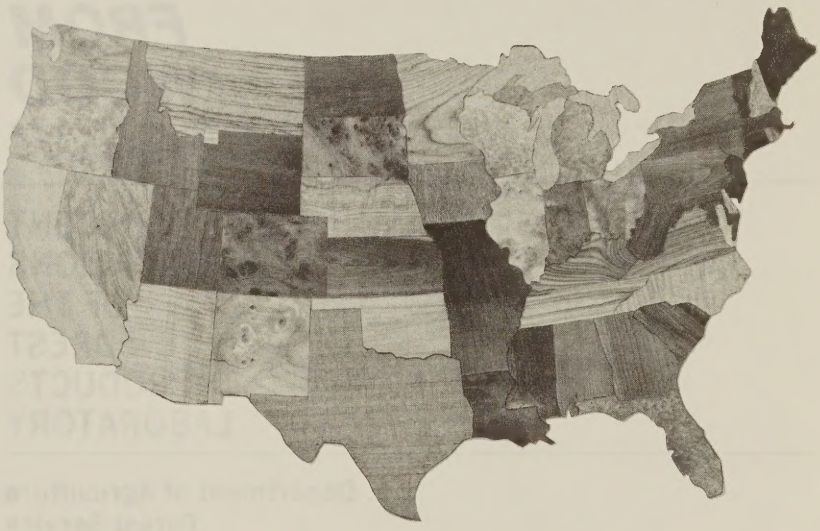
RECENT PUBLICATIONS OF THE FOREST PRODUCTS LABORATORY

FOREST SERVICE, USDA

DIVIDENDS FROM WOOD RESEARCH

RECENT PUBLICATIONS OF THE FOREST PRODUCTS LABORATORY

U.S. Department of Agriculture
Forest Service
Forest Products Laboratory
Madison, Wis. 53705
January 1973



[1] VENEER SPECIES THAT GROW IN THE UNITED STATES

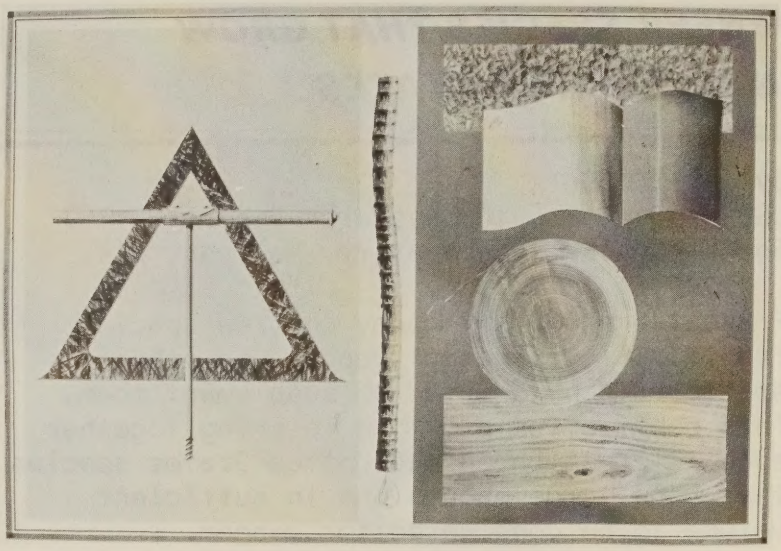
By John F. Lutz
USDA Forest Service Research Paper FPL 167
Forest Products Laboratory, Madison, Wis.

Pressures are heavy today on tree species traditionally used for veneer--so other species are being eyed to supplement them. This publication attempts to bring together such information on the United States species that grow large enough and in sufficient volume to be considered for veneer.

This information isn't all new, but it has never before been pulled together in this manner. The fragments were collected from the experiences of mill operators, foresters, wood technologists, and products manufacturers--all tied together with research results and seasoned judgment.

The summary should be particularly useful to those engaged in manufacturing veneer, as well as to growers of timber, log buyers, and users of veneer products. Each of the 156 tree species is considered for use in the general categories of construction plywood, decorative face veneer, inner plies of decorative panels, or container veneer and plywood.

To aid the user, the information was condensed into eight summary tables that mention--for each species--the volume and log characteristics, physical and mechanical properties of wood, cutting and drying of veneer, and the quality and uses of dry veneer.



[2]*WESTERN WOOD DENSITY SURVEY --- REPORT NO. 2*

By R. R. Maeglin and H. E. Wahlgren
USDA Forest Service Research Paper FPL 183
Forest Products Laboratory, Madison, Wis.

Quality of the major western softwood species--as determined by wood density--is the object of a long-term search by the Forest Service. This report adds new data to that given in the first progress report in 1965.

The six "new" species included in this report are ponderosa, sugar, western white, and lodgepole pine, Engelmann spruce, and western redcedar.

New mean specific gravity values by tree species include: Ponderosa pine, 0.37; sugar pine, 0.34; western white pine, 0.36; lodgepole pine, 0.38; Engelmann spruce, 0.35; and western redcedar, 0.32.

These specific gravity values change little from the values listed in the Wood Handbook in 1955, but the reliability of the new data is greater because of better sampling.

OTHER HIGHLIGHTS

ENVIRONMENT

3 The Wood Resource and the Environment--Some National Options and Alternatives, By J. F. Saeman, Forest Products Laboratory. 1972.

Wood is a versatile, renewable resource for many needs. It requires relatively little energy to process and causes relatively little damage to the environment. This paper presents the importance to the Nation of increased emphasis on efficient timber utilization rather than satisfying material needs with irreplaceable materials.

F P L PRESS-LAM

4 FPL Press-Lam Process: Fast, Efficient, Conversion of Logs Into Structural Products, By FPL Press-Lam Research Team. Forest Products Journal 21(11): 11-18. Nov. 1972.

Producing a laminated structural wood product by an innovative log-to-product system is now technically feasible. Thick rotary-cut veneer can be converted from bolts into a parallel-laminated continuous structural sheet in less than 30 minutes. The system also markedly improves yield, and at reasonable cost.

5 Feasibility of Producing a High-Yield Laminated Structural Product: Strength Properties of Rotary Knife-Cut Laminated Southern Pine, By R. C. Moody and C. C. Peters. USDA Forest Service Research Paper FPL 178. 1972.

Effect of the press-lam manufacturing technique on strength properties was determined on specimens laminated from four 1/2-inch-thick plies. In comparison to sawn material, strength was lower in clear wood bending and shear properties. However, expected gains by dispersing the strength-reducing characteristics in laminating may largely offset these indicated reductions.

6 Feasibility of Producing a High-Yield Laminated Structural Product: Residual Heat of Drying Accelerates Adhesive Cure, By R. W. Jokerst. USDA Forest Service Research Paper FPL 179. 1972.

Summarizes research on the laminating portion of this process for rapidly converting raw material to a finished product. A key feature is using the residual heat of drying to accelerate adhesive cure. The system appears simple and flexible enough to be fitted into a continuous production system.

Single copies of all publications listed in this booklet are available free from the Forest Products Laboratory while the supply lasts.

To request publications simply circle the item number on the back cover of this booklet, detach the card, and mail it to the Laboratory.

Blanket requests for publications cannot be filled.

MORE DIVIDENDS

CONSTRUCTION

7 Selection and Use of Wood Products for Home and Farm Building, By L. O. Anderson. USDA Agricultural Information Bulletin 311. Rev. 1972.

This new revision presents briefly the essential requirements for the usual wood-frame building purposes, and shows how various woods and wood-based products meet these specific requirements. Also emphasizes some basic principles--often overlooked--that should be followed in good construction.

8 Wood Structures Can Resist Hurricanes, By Gerald E. Sherwood. Civil Engineering-ASCE: 91-94. Sept. 1972.

Summarizes wood-frame construction methods for hurricane resistance. Surveys of buildings subjected to hurricane winds have shown that much damage can be prevented by good and effective connections between foundations, walls, and roof. Forces of high waves can be overcome by elevating buildings on piers.

9 Wood Products and Their Use in Construction, By Alan D. Freas. Presented at the World Consultation on the Use of Wood in Housing, Vancouver, British Columbia, 1971. Unasylva 25(2-3-4), Nos. 101-102-103: 53-68. 1971.

The use of wood and wood products in home construction varies greatly in different areas. This paper presents the essence of current wood use as a base for its adaptation to use in developing countries.

10 Problems Associated With the Development of Use of Wood in Construction and Possible Solutions. Part 1, Technical Aspects. Presented at the World Consultation on the Use of Wood in Housing, Vancouver, British Columbia, 1971. Unasylva 25(2-3-4), Nos. 101-102-103: 71-79. 1971.

Wood, when wisely used, can last indefinitely. It is primarily when wood is misused that problems develop. Paper discusses some factors that cause problems in the use of wood--fungi, insects, fire, finishes, fastening systems, and external forces.

11 A Facility to Evaluate Three-Dimensional Performance of House Modules, By K. H. Boller. USDA Forest Service Research Note FPL-0225. 1972.

An experimental facility was developed to mechanically evaluate strength and elastic properties in three dimensions of house modules up to 8 by 12 by 24 feet. The facility consists of a structural steel framework, a system to apply loads simulating service conditions, and an electronic system for acquiring data. The facility has been used satisfactorily to evaluate components of house modules.

DRYING

12 How PEG Helps the Hobbyist Who Works With Wood, By H. L. Mitchell. USDA Forest Service, Forest Products Laboratory Report. 1972.

Introduces polyethylene glycol-1000 (PEG) to hobbyists as an agent to dimensionally stabilize wood. Directions are given for mixing PEG solutions, preparing treating vats, and drying and gluing treated wood. Also gives directions for producing decorator clocks, bowls and other turnings, green wood carvings, statuary, and rifle stocks.

13 Accelerating Oak Air Drying by Presurfacing, By W. T. Simpson and R. C. Baltes. USDA Forest Service Research Note FPL-0223. 1972.

Compares air-drying rates of rough and presurfaced northern red oak and white oak. In both species the presurfaced material was about 1/8 inch thinner than the rough material and dried in 8 to 10 percent less time than the rough material.

14 A Calendar for Air-Drying Lumber in the Upper Midwest, By Raymond C. Rietz. USDA Forest Service Research Note FPL-0224. 1972.

Presents the number of air-drying days by month for the upper Midwest, ranging from 30 days for June-August to 5 days for December-February. Assuming about 60 days to air-dry green 1-inch lumber to 20 percent, the calendar can be used to estimate when green lumber will attain this moisture content.

15 Review of High-Temperature Kiln-Drying of Hardwoods, By E. M. Wengert. Southern Lumberman: 17-19. Sept. 15, 1972.

Reviews literature and evaluates advantages, problems, and probable costs of high-temperature (above 212° F.) drying at atmospheric pressures. Four most prevalent defects were collapse, end checking, honeycomb, and discoloration. Original kiln costs and maintenance are high, but energy requirements are lower and drying times shorter, thus showing a favorable economic picture.

FIBER PRODUCTS

16 Pulping Without Barking Increases Fiber Yield, By R. J. Auchter. Pulp and Paper 46(6): 6, 7. June 1972.

Bark associated with pulp chips is often said to increase chemical consumption, thus costing more and resulting in operating problems. Research disputes the differential. Results with pulping rough pulpwood chips were close to those for pulping cleanly debarked pulpwood chips.

17 Kraft Pulping of Pulpwood Chips Containing Bark, By R. A. Horn and R. J. Auchter. Paper Trade Journal: 55-59. Nov. 6, 1972.

The technical feasibility of producing an acceptable bleached kraft pulp from roughwood chips was established for 12 West Coast softwood species having an average bark content of 10 percent.

High Yields of Kraft Pulp from Rapid-Growth Hybrid Poplar Trees, By J. F. Laundrie and

18 J. G. Berbee. USDA Forest Service Research Paper FPL 186. 1972.

Kraft pulps were made from whole poplars of 1-, 3-, 5-, 11-, and 24-year growth rotations. Satisfactory pulps were made from all materials and the presence of bark posed no special problems. Best production was from a rotation of 11 years.

19 Trends and Prospects for Use in Fiber Products, By R. J. Auchter. USDA Forest Service General Technical Report NC-1: 40-44. 1972.

Aspen has good credentials for use in fiber products. It is light colored, making its use for groundwood attractive. It is readily pulped by any of the commercial processes and is the raw material most often used in process developments because of the ease of pulping.

20 Improving Comparability of Paperboard Test Results: Using Flexible and Rigid Type Testing Machines, By J. W. Koning, Jr., E. W. Kuenzi, R. C. Moody, and W. D. Godshall. Tappi 55(5): 757-760. May 1972.

Ring- and flat-crush strength values of paperboard and corrugated fiberboard can differ widely, depending on whether flexible or rigid type testing machines are used, even though machines are run according to recommended test procedures. Based on theoretical and experimental data, comparable results can be achieved with various types of compression testers if the upper platens of the machines are run at the same speed.

21 Effect of Relative Humidity Changes on Compressive Creep Response of Paper, By Von L. Byrd. Tappi 55(11): 1612, 1613. Nov. 1972.

Corrugated fiberboard specimens under edgewise compressive loads strained more and failed sooner in cyclic (90 to 35 pct.) relative humidity (RH) than in a constant (90 pct.) RH environment. Therefore, fiberboard is more likely to fail in uncontrolled RH environment (even though the average moisture content is lower) than in a constant RH environment.

GLU-LAM

22 Strength Criteria of Glued-Laminated Timber, By Billy Bohannan. National Bureau of Standards Special Publication 361, Vol. 1: 625-632. March 1972.

Since the early 1930's the U.S. Forest Products Laboratory has had a continuing research program to better define the strength characteristics of glued-laminated construction. This paper covers the progression in the development of glued-laminated stresses as they are controlled by knots.

23 Tensile Strength of Lumber Laminated from 1/8-Inch Thick Veneers, By R. C. Moody. USDA Forest Service Research Paper FPL 181. 1972.

The possibility of obtaining high strength tension members by laminating thin, relatively low-grade veneers was investigated. Results indicated that 2 by 4's laminated from 1/8-inch-thick, butt-jointed veneer may justify design stresses up to twice as high as sawn lumber obtainable from the same resource.

PANEL PRODUCTS

24 Moisture-Stability Relationships in Wood-Base Composition Boards, By W. F. Lehmann. Forest Products Journal 22(7): 53-59. July 1972.

Various physical properties, such as density, particle length, surface areas by gas adsorption, steady- and unsteady-state diffusion coefficients, and air permeability, were measured in a series of wood-base composition boards. Results were compared with measurements of dimensional stability. Linear movement during exposure was directly correlated to moisture absorption.

25 Reducing Particleboard Pressing Time: Exploratory Study, By B. G. Heebink, W. F. Lehmann, and F. V. Hefty. USDA Forest Service Research Paper FPL 180. 1972.

Minimum presstimes depended on a suitable combination of time and temperature to cure the binder and dispel moisture to avoid steam blisters. By proper selection of variables, an adequate 1/2-inch-thick board was produced in 1-minute presstime. Variables effective in reducing presstimes were higher press temperatures, fast press closing, and nonuniform mat moisture contents.

26 Some Views on Large Structural Particleboard Panels, By B. G. Heebink. USDA Forest Service Research Note FPL-0220. 1972.

The "recipe," technology, and hardware for producing large structural flake-type particleboards are currently available. Raw material could probably come from forest residue, presently being wasted in astronomical quantities, thus helping to solve the

anticipated shortage of panel products for building without reducing the forest inventory.

PACKAGING

27 Appalachian Hardwoods for Pallets: Correlation Between Service and Laboratory Testing, By R. K. Stern and D. E. Dunmire. USDA Forest Service Research Paper FPL 169. 1972.

Different types of pallets made from Appalachian hardwoods were compared in field and rough handling performance. "Picture frame" pallets were the most shock resistant of the reusables and the "notched stringer" type the least. Inconclusive data were obtained for the "expendable" types.

28 Method for Measuring and Controlling Web Tension of Corrugating Medium During Single Facing, By W. D. Godshall and J. W. Koning, Jr. USDA Forest Service Research Note FPL-0219. 1972.

An automatically controlled tension device, electronically coupled to a magnetically operated disk brake system, permitted accurate measurement and control of the web tension of the corrugating medium on an experimental singlefacer. This method improved accuracy in determining the runnability characteristics of corrugating medium. Results indicated that web tension could be regulated for increments as small as 0.3 pound per inch of web width.

PROPERTIES

29 Relationships of Specific Gravity to Tree Height in Commercially Important Species, By E. A. Okkonen, H. E. Wahlgren, and R. R. Maeglin. Forest Products Journal 22(7): 37-41. July 1972.

Relationships of wood specific gravity to height in tree were investigated for 28 commercially important timber species. In 17 species, specific gravity decreased with increase in height; in five species, specific gravity increased with increase in height; in three species, specific gravity decreased with increase in height, but was followed by an increase in specific gravity as height increased; and in three species, no significant change was observed.

PRESERVATION

30 Treatment of Alaskan Species by Double-Diffusion and Modified Double-Diffusion Methods, By L. R. Gjovik, H. G. Roth, and H. L. Davidson. USDA Forest Service Research Paper FPL 182. 1972.

Summarizes results of preservative treatments by two techniques on pole sections of Alaskan species. The modified double-diffusion method appreciably increased retentions and depths of preservative penetration in both green and kiln-dried pole sections over the conventional double-diffusion method. Results compared favorably with pressure treatment.

31 Dual Treatment of Marine Piles: Predrying and Treatment, By H. L. Davidson and

L. R. Gjovik. Proceedings, American Wood-Preservers' Association. 6 pp. 1972.

Predrying southern pine by 24-hour Boultonizing, or to outermost inch moisture levels of 40 or 25 percent by air or kiln, was sufficient to meet the AWPA C3-69 waterborne preservative requirements with a full-cell treatment. Identical drying following the waterborne treatment did not permit adequate creosote penetration.

32 Condition of Preservative-Treated Cooling Tower Slats After 10-Year Service, By L. R. Gjovik, B. A. Bendsten, and H. G. Roth. Forest Products Journal 22(4): 35-40. 1972.

Waterborne and oilborne preservatives reduced the expected loss in toughness due to fungi in four species of cooling tower slats exposed in a tower for 10 years. The absorption of water additives apparently also reduced fungal attack in untreated slats. Both treated and untreated slats have potential for additional service life.

33 Analyzing Creosote by Gas Chromatography: Relationship to Creosote Specifications, By L. F. Lorenz and L. R. Gjovik. Proceedings, American Wood-Preservers' Association. 8 pp. 1972.

Gas chromatography has been found an efficient and relatively accurate method to quantitatively and qualitatively determine major components of creosote. Analysis shows the overlap to be considerable in the composition of fractions obtained by AWPA flask distillation. In treated wood, creosote can be analyzed by vaporizing the creosote directly onto the chromatographic column.

SLICING

34 Thick-Slicing of Wood: Effects of Wood and Knife Inclination Angle, By C. C. Peters, A. F. Mergen, and H. R. Panzer. Forest Products Journal 22(9): 84-91. Sept. 1972.

Clear, flat-grained red oak and southern pine flitches were sliced 1/2 inch thick at 190° F. The knife and flitch were inclined at 45°, 67.5°, and 90° relative to the cutting motion. Best results occurred when the knife edge and grain direction were parallel, regardless of inclination angle.

YIELDS

35 Predicting Dimension Parts Cost: Taking the Guess Work Out of Cutting Order Yields Can Mean the Difference Between Profit and Loss, By David R. Schumann. Woodworking and Furniture Digest 74(7): 26-28. July 1972.

Data on yield of dimension parts determine which lumber grade or combination of grades is most economical to use for a particular cutting order. A method of arriving at processing costs is discussed comparing the processing of a large volume of low-grade lumber with that of a smaller volume of a higher grade.

HIGHLY TECHNICAL

ENGINEERING

36 Predicting Performance of Hardboard in I-Beams, By Terry J. Ramaker and Michael D. Davister. USDA Forest Service Research Paper FPL 185. 1972.

Design stresses derived from basic properties of hardboard were used with fundamental design criteria to design three glued I-beams with lumber flanges and tempered hardboard webs. The beam test results demonstrated that rational design procedures can be applied to hardboard as they are when designing with other engineering materials.

37 Modeling the Creep of Wood in a Changing Moisture Environment, By E. L. Schaffer. Wood and Fiber 3(4): 232-235. Winter 1972.

The change in the creep response of loaded wood specimens in environments where the humidity varies is explained by considering the effect of moisture diffusion within the specimen.

38 Analysis of Nailed Joints with Dissimilar Members, By T. L. Wilkinson. Journal American Society Civil Engineering, 9189, ST 9, 2005-2013. Sept. 1972.

Presents a theoretical method of analysis for two-member nailed wood joints under lateral load. The method allows for analysis of joints where the members are dissimilar in properties and thickness and where the nail may have different sizes, shapes, and material composition.

39 Design Parameters for Torsion of Sandwich Strips Having Trapezoidal, Rectangular, and Triangular Cross Sections, By H. M. Montrey and E. W. Kuenzi. USDA Forest Service Research Paper FPL 156. 1972.

Solutions for the elastic torsion of sandwich strips having triangular, rectangular, or trapezoidal cross sections are presented analytically in terms of suitable design parameters. Data obtained from resulting expressions are presented in a series of design curves for normalized values of torsional stiffness and maximum facing and core shear stresses.

40 A Computerized Wood Engineering System: Purdue Plane Structures Analyzer, By S. K. Suddarth. USDA Forest Service Research Paper FPL 168. 1972.

Gives directions, with an example, for using a computerized system to analyze plane wood-framed structures. An infinite variety of structural types is covered by the method, which isolates and identifies a mathematical model or analog that is created to represent the prototype structure.

41 Development of Basic Information for the Design of Paper Shipping Sacks, By Joseph Chern and E. W. Kuenzi. Tappi 55(10): 1477-1481. Oct. 1972.

A theoretical formula was derived to predict the drop height required to fail simulated sacks loaded with contents of diverse density and flow qualities. Good agreement was obtained between the results determined by formula and actual tests. The effects of number of plies (multiwall sacks) on sack strength was studied also.

42 Airborne Noise Control for Vertically Stacked Bathrooms with Mechanical Exhaust Systems, By R. E. Jones. USDA Forest Service Research Note FPL-0222. 1972.

Sound insulation properties of an otherwise satisfactory wall or floor can be nullified when noise flanks this surface. An example of such flanking is described for stacked bathrooms with two types of exhaust duct connection. One type resulted in strong dissatisfaction by the occupants, while the other resulted in no complaints.

BIOLOGICAL

43 Relationships in Black Walnut Heartwood Between Color and Other Physical and Anatomical Characteristics, By C. H. Hiller, F. Freese, and D. M. Smith. Wood and Fiber 4(1): 38-42. Spring 1972.

Relationships were explored between color and specific gravity, extractive content, and anatomical characteristics. Percent luminance (color brightness) was significantly related to extractive content and combinations of extractive content and some measure of wood density.

44 Studies of Two Species of Phellinus in Western North America, By Frances F. Lombard, R. W. Davidson, and R. L. Gilbertson. Mycopathologia et Mycologia Applicata 46(4): 351-365. 1972.

The original description of Fomes occidentalis Overh. is validated by a Latin diagnosis. The new combinations Phellinus occidentalis and Phellinus repandus are pro-

posed. Morphological characters of basidiocarps and cultures of the two species are given with data on their distribution, substratum relationships, associated rot, and relation to similar species.

45 Notes on Some Lignicolous Basidiomycetes of the Southeastern United States, By Harold H. Burdsall, Jr. Journal Elisha Mitchell Scientific Society 87(4): 239-245. Winter 1971.

Descriptions, illustrations, and discussion are provided for Columnocystis ambigua (Pk.) Pouzar, Hydnochaete olivaceum (Schw.) Banker, and Trechispora polyporoidea (Berk. and Curt. in Berk.) Liberta. Pseudofistulina brasiliensis (O. and K. Fidalgo) is considered to be conspecific with Fistulina radicata Schw. and the new combination is proposed in the genus Pseudofistulina.

46 Fate of Myo-Inositol in Fraxinus Tissue Cultures, By P. Jung, W. Tanner, and K. Wolter. Phytochemistry 11(5): 1655-1659. May 1972.

Analysis of ash tissue cultures grown on labeled myo-inositol indicated that the tissue was incapable of synthesizing endogenous myo-inositol, and ideal for metabolic studies. Results showed most of the metabolized inositol in the cell wall fraction, 21 percent in phosphatidylinositol and less than 0.5 percent in pectin, contrary to all other published results in higher plants.

47 Guying to Prevent Wind Sway Influences Loblolly Pine Growth and Wood Properties, By James D. Burton and Diana M. Smith. USDA Forest Service Research Paper SO-80. 1972.

Restraining young loblolly pine trees from normal swaying in the wind markedly reduced radial growth in the immobilized portion of the bole and accelerated it in the upper, free-swaying portion. Guying also reduced specific gravity, number of earlywood and latewood tracheids, latewood tracheid diameter, and amount of compression wood, but not percentage of latewood.

48 An Analysis of Charcoal from the Brewster Site (13CK15), Iowa, By L. A. Conrad and Robert C. Koeppen. Plains Anthropologist 17-55: 52-54. 1972.

Reports the results of the examination of charcoal samples from the Brewster site and demonstrates the importance of the preservation and identification of archaeological woody materials which may serve as environmental indicators.

CHEMICAL

49 Chemotaxonomy of Ulmus, By J. W. Rowe, M. K. Seikel, D. N. Roy, and E. Jorgensen. Phytochemistry 11(8): 2513-2517. 1972.

The heartwood of 10 elm species has been examined for the presence of six sesquiterpenes and four lignans. Six sterols were also identified. The section Madocarpus was distinctly different in its chemistry from the other four sections of this genus. The relationship of these compounds to Dutch elm disease resistance is discussed.

50 Wood and Pulp Chromophores: A Critical Review, By J. M. Harkin. Tappi 55(7): 991-996. July 1972.

Results presented at the 1972 TAPPI Conference on Chromophores in Wood and Pulps (polysaccharides, lignin, extractives, mineral traces) are important for wood color and discolorations during pulping. Chemical structures considered as chromophores in pulps do not fully explain pulp staining but are really only color precursors.

51 A Rapid Analysis for Total Carbohydrate in Wood or Pulp: Dehydrating to Furans in Concentrated Sulfuric Acid, By R. W. Scott and J. Green. Tappi 55(7): 1061-1063. July 1972.

A dehydration method of measuring total carbohydrate in wood or pulp, particularly adapted to glucose and xylose polymers, is described and compared to a reducing sugar method. Losses are usually smaller and less time is required than by the reducing sugar method.

52 Acyl Migrations in the Synthesis of Ethyl 4-O-Methyl-β-D-Glucopyranoside, By R. M. Rowell. Carbohydrate Research 23(1972): 417-424.

The title compound has been synthesized as a simple model system to represent a single, inner D-glucopyranose unit in a cellulose molecule, as part of an investigation of the mechanism of the alkaline cleavage of internal glycosidic bonds in cellulose. During preparation of this compound two different acyl migrations occurred.

53 Effects of Trans-α-Hydroxyl Groups in Alkaline Degradation of Glycosidic Bonds, By R. M. Rowell and J. Green. USDA Forest Service Research Paper FPL 188. 1972.

Increases in carbohydrate yield during alkaline pulping ultimately depend on retention of glycosidic bond, and it is found here that neighboring hydroxyl groups greatly affect the rate of glycosidic alkaline degradation.

54 Alkaline Decomposition of D-Xylose-1-C^{14}, D-Glucose-1-C^{14}, and D-Glucose-6-C^{14}, By John F. Harris. Carbohydrate Research 23(2): 207-215. July 1972.

The distribution of radioactivity in the three- and four-carbon saccharinic acids, lactic acid, and 2,4-dihydroxybutyric acid, obtained from D-xylose-1-^{14}C, D-glucose-1-^{14}C, and D-glucose-6-^{14}C, was measured. The relative importance of the various mechanisms for forming 2,4-dihydroxybutyric acid was determined. Recombination of two-carbon fragments was an important mechanism at the high alkalinity and temperature employed.

55 Kinetics of Oxidative Degradation of End Group Stabilized Cellulose Models, By R. M. Rowell. Tappi 55(9): 1326, 1327. 1972.

To increase the retention of cellulose during kraft pulping, the factors that influence the oxidative alkaline degradation of end unit stabilized cellulose models were evaluated. The following order of alkaline stability was found: α-hydroxy-acetals > α-hydroxy-primary alcohols > α-hydroxy-carboxylic acids >>> α-hydroxy-hemiacetals.

56 Terpenoids of Pinus Strobus Cortex Tissue, By D. F. Zinkel and B. B. Evans. Phytochemistry 11(10): 3387-3389. Oct. 1972.

Several diterpenes were isolated as major constituents of the extract of Pinus strobus L. cortex tissue. Two of these constituents, the corresponding aldehyde and alcohol of strobic acid, were present at an unusually high level relative to the strobic acid content. A new polyprenol was isolated from the needle extract.

57 **Removing Lignin from Wood with White-Rot Fungi and Digestibility of Resulting Wood, By T. Kent Kirk and Wayne E. Moore. Wood and Fiber 4(2): 72-79. Summer 1972.**

Some white-rot fungi degrade lignin in preference to the polysaccharides in wood. The resulting biologically delignified wood, in common with chemically delignified wood (pulp), is more digestible by polysaccharide-degrading enzymes, including those in rumen fluid. This work suggests that some fungi may be useful in the bioconversion of waste wood.


NATIONAL FOREST SYSTEM
COOPERATIVE FORESTRY
FORESTRY RESEARCH
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

PLACE
POSTAGE
HERE

INFORMATION SERVICES
U.S. FOREST PRODUCTS LABORATORY
MADISON, WISCONSIN 53705
U.S.A.

PLEASE CIRCLE DESIRED PUBLICATIONS

1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20 21 22 23 24

25 26 27 28 29 30 31 32 33 34 35 36

37 38 39 40 41 42 43 44 45 46 47 48

49 50 51 52 53 54 55 56 57

PLEASE REFER TO THE IDENTIFICATION NUMBER ON YOUR MAILING LABEL WHEN CORRESPONDING ABOUT THE MAILING LIST OF PUBLICATIONS

IMPORTANT

TO RETAIN YOUR NAME ON OUR MAILING LIST, CARDS MUST BE RETURNED WITHIN 30 DAYS

PLEASE ☐ CONTINUE

☐ DISCONTINUE MY NAME ON LIST

PLEASE PRINT NEW ADDRESS IF CHANGED

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE, ZIP CODE _____

USDA-FOREST SERVICE
SA-S+PF-RUM UNIT
SUITE 800, 1720 PEACHTREE RD
ATLANTA, GA 30309

PLEASE DO NOT REMOVE MAILING LABEL

CUT ALONG THE DOTTED LINE